Growth and biochemical composition of Kappaphycus (Rhodophyta) in customized tank culture system

Abstract

The study was conducted to determine the growth and biochemical composition of Kappaphycus cultivated in a customized tank culture system. Two red seaweed species (Kappaphycus alvarezii and Kappaphycus striatum) were selected and cultivated using suspension culture method in the tank. Three cycles of 40-day culture trials were performed during September to December 2014, and both K. alvarezii and K. striatum were successfully grown in the tank. This is the first report on the success of seaweed culture in Malaysia involving land-based facility. Interestingly, K. striatum was found to grow better than K. alvarezii in the tank. The daily growth rate (DGR) and daily weight productivity (DWP) of K. alvarezii ranged from 1.96 ± 0.08 to 2.29 ± 0.11 % day−1 and 3.70 ± 0.20 to 4.55 ± 0.34 g DW m−2 day−1, and those of K. striatum ranged from 2.25 ± 0.06 to 2.96 ± 0.02 % day−1 and 4.48 ± 0.19 to 6.17 ± 0.18 g DW m−2 day−1, respectively. These values were influenced by the changes in the water quality variables during the culture period. On the other hand, the biochemical composition of K. alvarezii and K. striatum was not significantly different ($p > 0.05$) from each other. Both growth and biochemical composition of K. alvarezii and K. striatum in the present study were comparable with those cultured in the open sea. In conclusion, the findings indicate the ability of Kappaphycus to grow well in land-based cultivation system which can be further explored to support the development of local seaweed farming industry especially for the high-quality seed production.